

REMARKS

The drawings and claims 1, 2, 4, 6, 7, 9-14, and 24 have been amended, claims 8 and 17 have been canceled, and claims 44 and 45 have been added. Accordingly, claims 1-7, 9-16, 18-36, 44, and 45 are currently pending in the case. Further examination and reconsideration of the presently claimed application are respectfully requested.

Allowable Subject Matter

Claims 5, 9, 11, 17, and 36 were objected to as being dependent upon a rejected base claim and were deemed allowable if rewritten in independent form. Applicant sincerely appreciates the Examiner's recognition of the patentable subject matter recited in those claims. To expedite prosecution, claim 17 has been canceled and claim 14 has been rewritten to include its limitations. Accordingly, claim 14 is in condition for allowance. As will be set forth below, claims 1 and 19, as well as claims dependent therefrom, are patentably distinct from the cited art. Accordingly, removal of this objection is respectfully requested.

Section 102(e) Rejections

Claims 1-4, 6, 7, and 14-16 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,526,172 to Kanack (hereinafter referred to as "Kanack"). A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP 2131. Kanack does not teach or suggest all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below. As such, the rejections of claims 1-4, 6, 7, and 14-16 are respectfully traversed.

Kanack fails to disclose a microelectromechanical device including a contact structure.

Claim 1 recites in part: "[a] microelectromechanical device, comprising ... multiple contact structures ..." Claim 14 includes a similar limitation noting the inclusion of a single contact structure. Kanack discloses a spatial light modulator (SLM) device in Fig. 4 which is configured to pull or deflect membrane 42 toward or away from electrode 46b. The Office Action cites electrode 46b as a contact structure, however, such an interpretation of electrode 46b is traversed since Kanack does not teach electrode 46b as a structure to which contact may be made by any component within the SLM device described therein. In particular,

Kanack specifically teaches drawing beam 42 toward electrode 46b without contacting electrode 46b such that a dielectric medium remains interposed between the two components. In this manner, a parallel plate capacitor may be formed. Since Kanack fails to teach or suggest making contact to electrode 46b, electrode 46b cannot serve as a contact structure as defined by the presently claimed case. Consequently, Kanack fails to anticipate the limitations of claims 1 and 14. Since claims 2-4, 6, 7, 15 and 16 are dependent from claims 1 and 14, it is asserted that Kanack fails to anticipate the limitations of claims 2-4, 6, 7, 15 and 16 for at least the same reasons as those claims. Accordingly, removal of this rejection is respectfully requested.

Section 103(a) Rejections

Claims 8, 10, 12, 13, and 18-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kanack in view of U.S. Patent No. 5,619,061 to Goldsmith et al. (hereinafter referred to as "Goldsmith"). As noted above, claim 8 has been canceled and, thus, its rejection is moot. To establish a *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F. 2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990). The cited art does not teach or suggest all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

None of the cited art teaches or suggests a microelectromechanical device having a pair of electrodes arranged beneath a beam and multiple contact structures interposed between the electrodes, wherein a distance a distance between a first contact structure and the beam is larger than a distance between a second contact structure and the beam when substantially no power is applied to the device. Amended claim 1 recites in part:

A microelectromechanical device, comprising: ... a pair of electrodes arranged beneath the beam; and multiple contact structures interposed between said pair of electrodes, wherein a distance between a first contact structure and the beam is larger than a distance between a second contact structure and the beam when substantially no power is applied to the device.

Although there is no motivation to combine the teachings of Kanack and Goldsmith since Kanack does not teach a device with a contact structure, claim 1 has been amended in an attempt to expedite the prosecution of the presently claimed case. Support for the limitation added to claim 1 may be found, for example, in Figs. 5 and 10 and corresponding text of the Specification.

As noted on page 3 of the Office Action, Kanack fails to disclose a microelectromechanical device having multiple contact structures. As such, Kanack cannot teach a device in which a distance between one contact structure and an overlying beam is greater than a distance between another contact structure and the beam. Consequently, Kanack fails to teach or suggest the limitations of claim 1. Although Goldsmith does teach a device with two microstrip segments interposed between a pair of electrodes in Fig. 29h, Goldsmith fails to teach or suggest a distance variation between the contact structures and the beam when substantially no power is applied to the device. In particular, Goldsmith fails to teach or suggest one contact structure having an upper surface above an upper surface of another contact structure and/or the beam having a recessed portion above one of the contact structures as recited in claims 9 and 11, respectively. As noted above, the subject matter of claims 9 and 11 have been deemed allowable. The limitations of claim 9 and 11 offer a device in which the distance between contact structures and an overlying beam varies when substantially no power is applied to the device. Since there is no teaching or suggestion of a device with such a limitation in Goldsmith, it is asserted that claim 1 is patentably distinct from Goldsmith.

None of the cited art teaches or suggests a microelectromechanical device having an insulating element interposed between respective ends of a beam. Claim 14 recites in part: “[a] microelectromechanical device, comprising: a beam suspended by support structures affixed to respective ends of the beam, wherein the beam comprises an insulating element interposed between the respective ends of the beam ...” Although there is no motivation to combine the teachings of Kanack and Goldsmith since Kanack does not teach a device with a contact structure, claim 14 has been amended in an attempt to expedite the prosecution of the presently claimed case. As noted above, the amendment to claim 14 includes the limitation of canceled claim 17, which was deemed allowable in the Office Action if rewritten in independent form. As such, claim 14 is patentably distinct over the cited art.

None of the cited art provides any motivation to optimize a microelectromechanical device to include at least three contact structures laterally spaced along and under a length of a beam and interposed between a pair of electrodes. Claim 19 recites: “[a] microelectromechanical device

comprising at least three contact structures interposed between a pair of electrodes, wherein the contact structures and pair of electrodes are laterally spaced along and under a length of a beam.” As noted above, Kanack fails to disclose a micromechanical device including a contact structure, much less multiple contact structures. Although Goldsmith teaches the inclusion of two microstrip segments laterally spaced along the length of a metal membrane in Fig. 29h, Goldsmith fails to disclose a device having more than two contact structures between a pair of electrodes.

The Office Action surmises that the inclusion of more than two contact structures within a device could be determined by routine optimization in light of the teachings of Goldsmith. Goldsmith specifically teaches that one of the two microstrip segments shown in Fig. 29h serves as an input segment and the other microstrip segment serves as an output segment. Such a specific designation of the microstrip segments does not lend one skilled in the art to include additional microstrip segments within a device derived therefrom. In addition, there is no teaching or suggestion within Goldsmith of adding further microstrip segments within the device, much less arranging additional microstrip segments such that all microstrip segments are interposed between the electrodes of the device. Furthermore, there is no teaching or suggestion that varying the number of microstrip segments within the device would achieve a particular result. A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antoine*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) MPEP 2144.05. As such, in light of the teachings of Goldsmith or lack thereof, there is no motivation to include additional contact structures within the device described therein, much less include all of such contact structures between a pair of electrodes as in the presently claimed case. Consequently, claim 19 is asserted to be patentably distinct over the cited art.

For at least the reasons set forth above, none of the cited art, either individually or in combination, teaches, suggests, or provides motivation for all limitations of independent claims 1, 14, or 19. Accordingly, claims 1, 14, and 19, as well as claims dependent therefrom, are patentably distinct over the cited art. Accordingly, Applicants respectfully request removal this rejection.

In addition to being patentable for reasons set forth above, some of the dependent claims are believed to be separately patentable. In particular, claims 33-35 specify the placement of the at least three contact structures within the microelectromechanical device, relative to each other, the electrodes and the beam. As noted above, neither Kanack nor Goldsmith teach or suggest a device having more than two

contact structures arranged along a length of a beam. As such, neither Kanack nor Goldsmith cannot teach or suggest the limitations of claims 33-35.

Claims 23 and 24 specify that the beam includes residual forces adapted to bring the beam into contact with one or more of the contact structures and curl the beam away from one or more of the contact structures, respectively. In addition, claims 28-31 specify adaptations of the device to pull the beam away from one or more of the contact structures. The Office Action states the term 'adapted to' does not provide a positive limitation by which to further limit the claims. On the contrary, the aforementioned claim terminology is used in the present claims to impart proper functional limitations upon the claimed microelectromechanical device. In other words, the use of such terminology may define a claim element by what it does, rather than by what it is. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971), MPEP 2173.05(g). In fact, functional limitations, like any other claim limitations, must be evaluated and considered for what they fairly convey to a person of ordinary skill in the pertinent art. MPEP 2173.05(g). Such an evaluation may be used to show that functional limitations are definite and proper, as illustrated by more recent court decisions.

For example, claim language calling for a sleeve "adapted to be fitted" over an insulating jacket has been ruled to impart structural limitation to the sleeve rather than to merely direct activities which may take place in the future. *In re Venezia*, 189 USPQ 149 (CCPA 1976), MPEP 2173.05(g). The court's opinion states in part:

As we view these claims, they precisely define a group or "kit" of interrelated parts. These interrelated parts may or may not be later assembled to form a completed connector. But what may or may not happen in the future is *not* a part of the claimed invention. The claimed invention does include present structural limitations on each part, which structural limitations are defined by how the parts are to be interconnected in the final assembly, if assembled.

The opinion further states:

Again, a present structural configuration for the housing is defined in accordance with how the housing interrelates with the other structures in the completed assembly...More particularly, we find nothing indefinite in these claims. One skilled in the art would have no difficulty in determining whether or not a particular collection of components infringed the collection of interrelated components defined by these claims.

A similar line of reasoning may be properly applied to the functional limitations in the present claims. For example, a limitation on a beam to include residual forces that are adapted to bring the beam in contact with and/or curl the beam away from contact structures outlines the material characteristics of the beam. In addition, a limitation of a device to include adaptations by which to pull a beam away from one or more contact structures, particularly through the application of an actuation voltage and/or release of a closing voltage may outline the dimensional and layout configurations of components within the device to achieve such deflection characteristics. In any case, the "adapted to" terminology included within claims 23, 24, and 28-31 does place limitations on the claimed microelectromechanical device and, therefore, is asserted to be definite. Claims 1, 2, 4, 6, 7, 14-16, 22, 24, 26 and 27 include "adapted to" terminology as well and are asserted to be definite similar to the reasons presented above.

Patentability of the Added Claims

The present amendment adds claims 44 and 45, which are dependent upon claim 14 and, therefore, are patentably distinct over the cited art for at least the same reasons as that claim. Accordingly, approval of added claims 44 and 45 is respectfully requested.

CONCLUSION

This response constitutes a complete response to all of the issues raised in the Office Action mailed October 27, 2003. In view of the remarks traversing the rejections in the Office Action, Applicants assert that pending claims 1-7, 9-16, 18-36, 44, and 45 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment, to Conley Rose, P.C. Deposit Account No. 03-2769/5683-00500.

Respectfully submitted,

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